

P. ENT COOPERATION TREA

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 18 May 2000 (18.05.00)	
International application No. PCT/EP99/07489	Applicant's or agent's file reference HL57357/009/CIV
International filing date (day/month/year) 06 October 1999 (06.10.99)	Priority date (day/month/year) 09 October 1998 (09.10.98)
Applicant LINDGREN, Stefan et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

22 March 2000 (22.03.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer F. Baechler
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference HL57357/009/CIV		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP99/07489	International filing date (day/month/year) 06/10/1999	Priority date (day/month/year) 09/10/1998
International Patent Classification (IPC) or national classification and IPC H04Q7/32		
Applicant TELEFONAKTIEBOLAGET LM ERICSSON et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of two sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 22/03/2000	Date of completion of this report 15.01.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Rabe, M Telephone No. +49 89 2399 8801 <div> </div>

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP99/07489

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

Description, pages:

1-5 as originally filed

Claims, No.:

1-6 with telefax of 09/11/2000

Drawings, sheets:

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

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☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 2,3,5,6
	No:	Claims 1,4
Inventive step (IS)	Yes:	Claims
	No:	Claims 1-6
Industrial applicability (IA)	Yes:	Claims 1-6
	No:	Claims

**2. Citations and explanations
see separate sheet**

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Reference is made to the following documents:

D1: US-A-5 526 403

D2: US-A-5 790 817

A. Citations and explanations made in respect of paragraph V:

1. Document **D1** (see in particular abstract; column 1, lines 9 to 12; column 2, lines 9 to 13; column 5, line 1 to column 6, line 27; Figure 5) discloses, in accordance with **all** the features of **claim 1**, a telecommunications terminal (see in particular column 1, lines 9 to 12; Figure 5) comprising a communication bus (see "24" in Figure 5), a radio module (see "12" in Figure 5) which is connected to the communications bus and which is operable to receive and to transmit radio telephone communications signals (see in particular column 5, lines 17 to 23), and at least one connection module (see "20" in Figure 5) which is connected to the communications bus in parallel to the radio module and which is operable to connect the terminal to a fixed telecommunications network (see in particular column 5, lines 35 to 45), the radio module also being operable to communicate with the connection module via the communications bus (see in particular column 6, lines 13 to 27 in combination with Figure 5).

The subject-matter of claim 1 therefore is **not new**, Article 33 (2) PCT.

2. Furthermore, document **D1** (see in particular abstract; column 1, lines 9 to 12; column 2, lines 9 to 13; column 5, line 1 to column 6, line 27; Figure 5) discloses, in accordance with **all** the features of **independent claim 4**, a radio communications terminal (see in particular column 1, lines 9 to 12; Figure 5) comprising: an open standard bus (see "24" in Figure 5); a radio modem (see in particular column 5, lines 17 to 34; "12" in Figure 5), including: air interface functionality (see in particular "120" and "13" in Figure 5); logic (see in particular "121" and "124" in Figure 5); and an interface to the open standard bus (see in particular "24" in Figure 5); and at least one stand-alone module (see "20" in Figure 5), providing a communications function, and having an interface to the open standard bus.

The subject-matter of independent claim 4 therefore is **not new**, Article 33 (2) PCT.

3. It should furthermore be noted that even if novelty of claims 1 and 4 could be argued, based on minor differences between the features of said claims and those disclosed in document **D1**, the subject-matter of said claims would **not involve an inventive step**, Article 33 (3) PCT, having regard to the disclosure of document **D1** and the normal knowledge of a person skilled in the art of (modular) telecommunications terminals (see in this respect also document **D2** (in particular column 2, lines 9 to 28 and 41 to 64; column 8, lines 1 to 32; Figure 3) which also describes the principle of a telecommunications terminal comprising a communications bus to which are connected multiple different wireless/wired connection modules).
4. **Dependent claims 2, 3, 5 and 6** do **not** appear to contain any additional features which, in combination with the features of any claim to which they refer, involve an inventive step for the reason that the subject-matter of said claims **either is in principle** directly derivable from the disclosure of document **D2** (for claims **2 and 3**: see in particular column 2, lines 41 to 53 and column 8, lines 9 to 32; for claim **5**: see in particular Figure 3), **or** represents minor design details which are based on the general knowledge of the person skilled in the art of (modular) telecommunications terminals and related implementation of different functionalities.

Dependent claims 2, 3, 5 and 6 therefore **do not** meet the requirements of Article 33 (3) PCT.

B. Remarks made in respect of paragraph VII:

1. To meet the requirements of Rule 5.1 (a) (ii) PCT, the documents **D1 and D2**, which represent a relevant state of the art with regard to the present invention, should have been identified in the opening part of the description and the relevant back-ground art disclosed therein should have been briefly discussed.
2. To meet the requirements of Rule 6.3 (b) PCT, any independent claim should

have been **correctly** cast in the **two-part form**, with those features which in combination are part of the nearest prior art (eg. document **D1**) being placed in the preamble.

3. **Reference signs** in parentheses should have been inserted in all the claims to increase their intelligibility, Rule 6.2 (b) PCT. This applies both to the preamble and to the characterizing portion.

C. Remarks made in respect of paragraph VIII:

The following amendments would have been necessary in the **claims**:

1. It appears from the present description, in particular from the detailed description of the invention on page 2, line 24 to page 4, line 4, that the control module and the man-machine interface are **essential technical features of the invention**.

As **independent claims 1 and 4** do not include these features, said claims do **not** meet the requirement following from Article 6 PCT taken in combination with Rule 6.3 (b) PCT that any independent claim must **contain all the technical features essential to the definition of the invention**.

Claims 1 and 4 therefore should have been correspondingly amended.

It should however be noted that, even if these features were included in said claims, the same considerations as set out in paragraphs 1 to 3 of above part A would still apply, as these features are also disclosed in document D1 (see in particular Figure 5 and corresponding parts of the description).

2. In line 4 of claim 2 as well as in line 5 of claim 3, "into" should have been replaced by "**to**" (Article 6 PCT).
3. In line 6 of claim 3, "connection module" should have been replaced by "**radio module**" (Article 6 PCT).

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EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP99/07489

4. The feature "radio **modem**" of claim 4 is not referred to in the description (note that the description merely discloses a "radio module"). Claim 4 is therefore not fully supported by the description as required by Article 6 PCT.

A corresponding amendment therefore would have been necessary in claim 4.

CLAIMS

1. A telecommunications terminal comprising a communications bus, a radio module which is connected to the communications bus and which is operable to receive and to transmit radio telephone communications signals, and at least one connection module which is connected to the communications bus in parallel to the radio module and which is operable to connect the terminal to a fixed telecommunications network, the radio module also being operable to communicate with the connection module via the communications bus.

2. A terminal as claimed in claim 1, comprising a plurality of such radio modules which are operable to communicate with respective radio telecommunications networks, and which are connected into the communications bus in parallel to one other and to the connection module.

3. A terminal as claimed in claim 1 or 2, comprising a plurality of such connection modules which are operable to communicate with respective fixed telecommunications networks, and which are connected into the communications bus in parallel to one other and to the connection module.

4. A radio communications terminal, comprising:
an open standard bus;
a radio modem, including:
air interface functionality;
logic; and
an interface to the open standard bus; and
at least one stand-alone module, providing a communications function, and having an interface to the open standard bus.

5. A terminal as claimed in claim 4, comprising means for connection of at least one additional stand-

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alone module to the open standard bus.

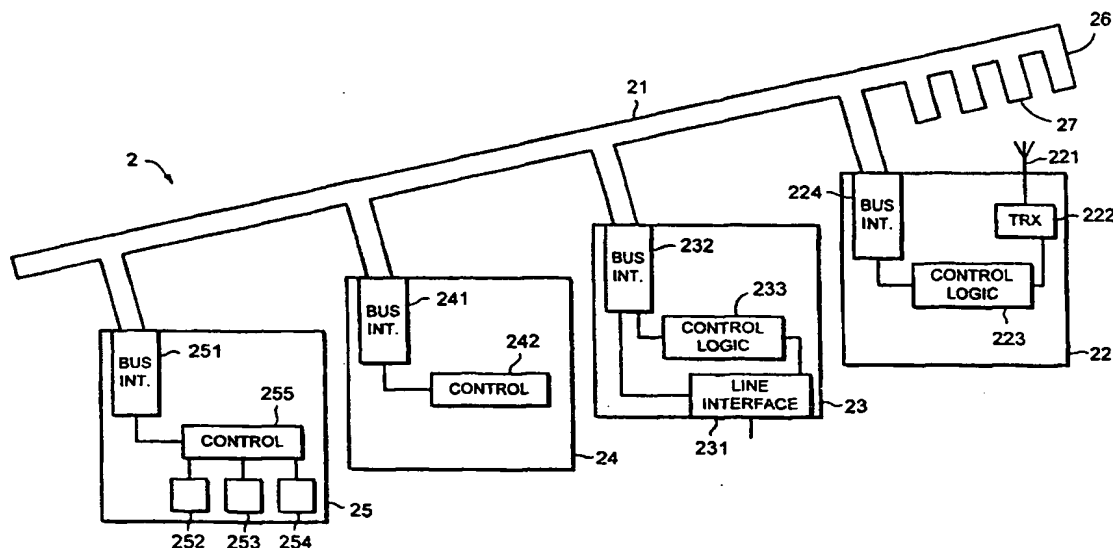
6. A terminal as claimed in claim 4 or 5,
wherein the open standard bus is a Universal Serial
Bus.



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : H04Q 7/32, H04B 1/40		A1	(11) International Publication Number: WO 00/22857
			(43) International Publication Date: 20 April 2000 (20.04.00)
(21) International Application Number: PCT/EP99/07489 (22) International Filing Date: 6 October 1999 (06.10.99) (30) Priority Data: 9822100.5 9 October 1998 (09.10.98) GB (71) Applicant (for all designated States except US): TELEFONAK- TIEBOLAGET LM ERICSSON [SE/SE]; S-126 25 Stock- holm (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): LINDGREN, Stefan [SE/SE]; Brännkyrkagatan 42, S-118 22 Stockholm (SE). WULFF, Mattias [SE/SE]; Ynglingagatan II, S-113 47 Stockholm (SE). GRIMLUND, Olof [SE/SE]; Hagavägen 6, 4tr, S-171 53 Solna (SE). LUNDQUIST, K-G [SE/SE]; Sportvägen 7, S-187 35 Täby (SE). OLOFSSON, Johan [SE/SE]; Filarvägen 9, S-176 71 Järfälla (SE). (74) Agent: VIGARS, Christopher, Ian; Haseltine Lake & Co., Imperial House, 15-19 Kingsway, London WC2B 6UD (GB).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.	

(54) Title: TELECOMMUNICATIONS TERMINALS



(57) Abstract

A structure is disclosed for a telecommunications terminal. The terminal includes an open bus and stand-alone modules which provide the required communications functionality. For example, modules might be provided for connection to an ISDN network, and for connection to a radio communications network such as a DECT system.

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TELECOMMUNICATIONS TERMINALS

The present invention relates to telecommunications terminals. In particular, the invention relates to a structure for a telecommunications terminal which allows the same structure to be used for terminals having different functionalities.

DESCRIPTION OF THE RELATED ART

A typical fixed radio telecommunications terminal may have a radio transceiver, a radio system interface, a user interface, including a keypad, a microphone and a loudspeaker, and connecting logic units.

One previously considered way of reducing cost in such devices has been to integrate as much functionality as possible into one semiconductor integrated circuit. Such devices can then be manufactured efficiently in large numbers.

However, such a technique is not well-suited to an environment in which customers demand a large variety of functionality. It then becomes difficult to design low-cost solutions that can provide all the required services and functions. For example there are problems combining different techniques such as GSM and DECT (Digital Enhanced Cordless telephony) in one unit. It may be necessary to provide a range of integrated circuits, which can, between them, provide the required range of functions, with the result that the time and cost associated with the design of each integrated circuit are used less efficiently.

SUMMARY OF THE PRESENT INVENTION

The present invention seeks to provide a structure which can be used to offer telecommunications terminals having a range of functionality. More specifically, the invention provides a modular structure for a

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telecommunications device.

Embodiments of the invention may provide a telecommunications device having a bus, to which different modules may be connected as desired.

5 According to one specific embodiment of the present invention there is provided a telecommunications terminal comprising a communications bus, a radio module which is connected to the communications bus and which is operable to receive and
10 transmit radio telecommunications signals and transmit radio telecommunications signals, and a plurality of connection modules which are connected to the communications bus in parallel to one another and to
15 the radio module and which are operable to connect the terminal to respective telecommunications networks, the radio module also being operable to communicate with at least one of the connection modules via the communications bus.

BRIEF DESCRIPTION OF THE DRAWINGS

20 Figure 1 is a schematic diagram illustrating the structure of a telecommunications terminal in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

25 Figure 1 shows the architecture of a telecommunications terminal 2 embodying the present invention. The terminal 2 includes a communications bus 21, a radio module 22, a line connection module 23, and a control module 24. Also connected to the bus 21 is a man-machine interface 25. The radio module 22,
30 the line module 23, and the control module 24 are connected in parallel to, and communicate with one another via, the communications bus 21.

The communications bus is a standard open communications bus. For example, the bus could be the

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universal standard bus (USB) and can provide a highly flexible base for carrying both data and telephony information between the modules in the terminals.

5 The radio module 22 contains the air interface function for interfacing with the desired radio telecommunications network. Specifically, the radio module 22 has a connection to an antenna 221, transceiver circuits 222, associated control logic 223
10 in the form of hardware and/or software, and an interface 224 to the communications bus. The radio system could for example relate to a digital enhanced cordless telephony system such as DECT, CT2, or CT3. Thus, the transceiver circuits 222, under the control
15 of the logic circuits 223, converts signals received from the bus 21 into a form suitable for transmission over the air interface, and vice versa.

The line module 23 includes the relevant functionality required to connect to fixed telecommunication systems, namely an interface circuit
20 231, together with a bus interface device 232 and connecting logic 233 in hardware and/or software. The telecommunication system supported by the module could for example be an integrated services digital network. Thus, the interface circuit 231, under the control of
25 the logic circuits 233, converts signals received from the bus 21 into a format suitable for transmission over the fixed network, and vice versa.

Overall control terminal of the terminal resides in the control module 24, which includes a bus
30 interface 241 and a processor 242 with appropriate associated memory devices.

The man-machine interface 25 also includes a bus interface 251, but is otherwise generally conventional, in that it includes a keypad 252 for receiving data

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input by a user, a microphone 253 for receiving speech from a user, and a loudspeaker 254 for providing audio outputs to a user, all under the control of a control circuit 255.

5 Importantly, in accordance with the invention, the radio module 22, and line connection module 23 are removable and replaceable. Moreover, the bus has connections 26, 27, etc. for other radio modules and line connection modules providing different
10 functionality.

 For example, other line connection modules might provide a connection to a plain old telephony system (POTS), or an ethernet connection to a LAN.

 Other radio modules might provide a connection to
15 a personal handyphone system (PHS) a digital advanced mobile phone system (D-AMPS), a wide band CDMA system (W-CDMA) or the Qualcomm CDMA system (IS-95).

 In addition, other modules can easily be devised for connection to the connections 26, 27 of the
20 terminal 2, such as an uplink module for cable TV, a CCTV surveillance system or other such devices.

 Thus an embodiment of the present invention splits the functionality of the terminal into stand alone modules which are interconnected by the standard bus.

25 In this way, the user is able to obtain a telecommunications terminal which provides the functionality which he requires. For example, if it is necessary for the user to be able to transmit signals received in a CCTV surveillance system, and to be able
30 to transmit them either over a LAN and or over a GSM mobile telephone network, the terminal can be provided with the necessary modules to allow these options.

 The architecture of the present invention can provide a low cost hardware solution to the problem of

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supplying devices with such a wide range of functionality because it can make use of high volume standard components which are able to be used with many different functional devices.

5 The structure of the present invention has several clear benefits over the prior art devices. Terminals in accordance with the invention can provide clear interfaces between different services and functions, which can allow short lead times when developing new
10 functionality, and can support parallel development projects, because it is only necessary to consider the new functionality in isolation, rather than having to consider its impact on other features of the device, as would be necessary in an integrated device. In
15 addition, such a terminal can reuse old functionality and integrate many different systems into a single terminal. Moreover, the user can add new modules and features as required, making it easy to expand the functionality of such a system.

20 There is thus provided a telecommunications terminal having a structure which allows the manufacturer to provide a range of products having features chosen by the user, while allowing the user to update the terminal when required.

CLAIMS

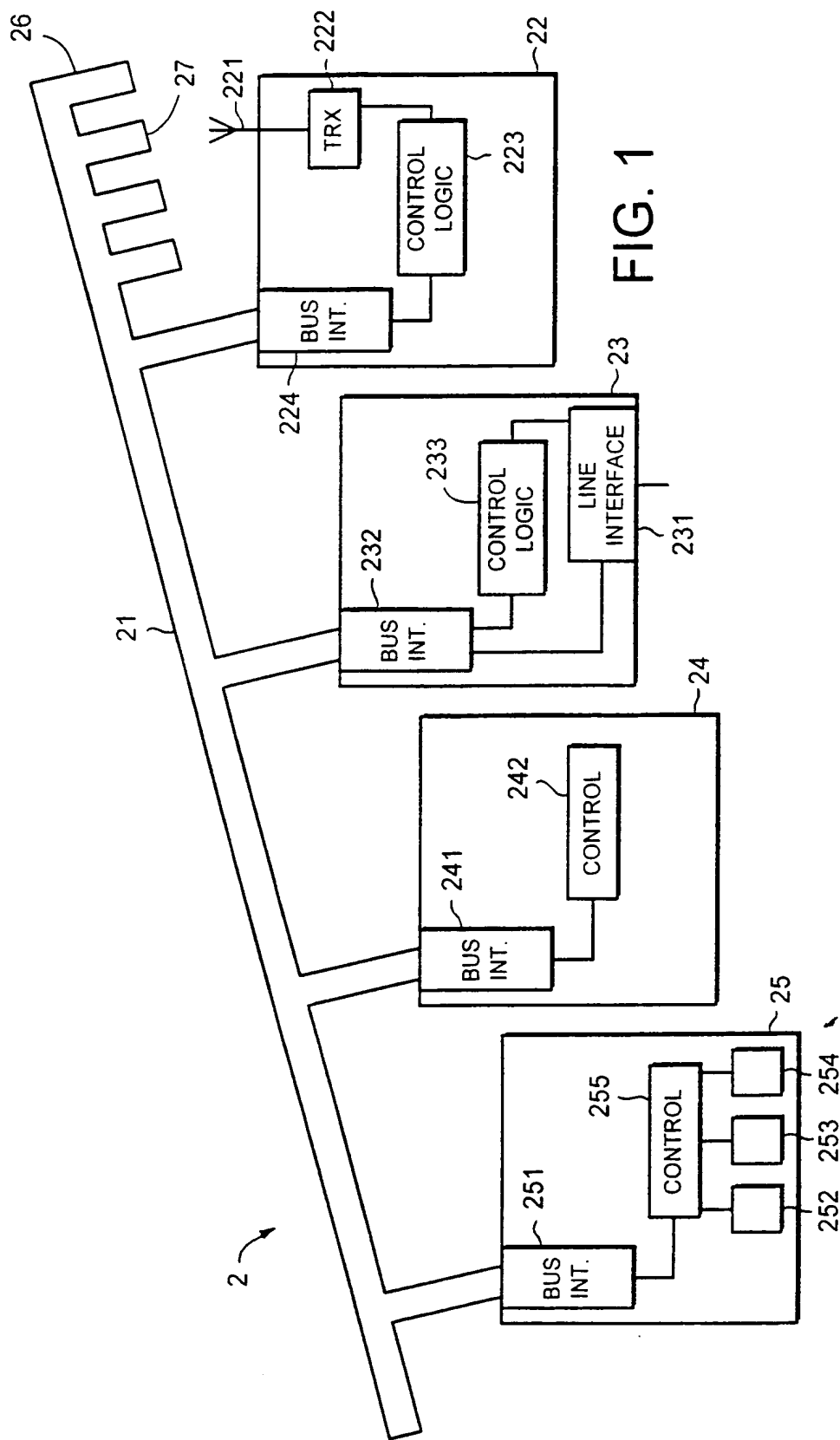
1. A telecommunications terminal comprising a communications bus, a radio module which is connected to the communications bus and which is operable to receive and to transmit radio telephone communications signals, and at least one connection module which is connected to the communications bus in parallel to the radio module and which is operable to connect the terminal to a fixed telecommunications network, the radio module also being operable to communicate with the connection module via the communications bus.
2. A terminal as claimed in claim 1, comprising a plurality of such radio modules which are operable to communicate with respective radio telecommunications networks, and which are connected into the communications bus in parallel to one other and to the connection module.
3. A terminal as claimed in claim 1 or 2, comprising a plurality of such connection modules which are operable to communicate with respective fixed telecommunications networks, and which are connected into the communications bus in parallel to one other and to the connection module.
4. A radio communications terminal, comprising:
 - an open standard bus;
 - a radio modem, including:
 - air interface functionality;
 - logic; and
 - an interface to the open standard bus; and
 - at least one stand-alone module, providing a communications function, and having an interface to the open standard bus.
5. A terminal as claimed in claim 4, comprising means for connection of at least one additional stand-

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alone module to the open standard bus.

6. A terminal as claimed in claim 4 or 5,
wherein the open standard bus is a Universal Serial
Bus.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/07489

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q7/32 H04B1/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q H04M H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 526 403 A (TAM AMBROSE W C) 11 June 1996 (1996-06-11) column 2, line 9 - line 32 column 3, line 60 - column 4, line 9 claims 1,2 figure 5	1
A	US 5 790 817 A (ASGHAR SAF M ET AL) 4 August 1998 (1998-08-04) column 2, line 41 - column 4, line 11 column 5, line 22 - line 55 column 7, line 22 - line 37 column 8, line 1 - line 16 figures 2,3	1-4



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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Date of the actual completion of the international search

17 January 2000

Date of mailing of the international search report

24/01/2000

Name and mailing address of the ISA

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Authorized officer

Barel, C

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/07489

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 109 402 A (KEASHLY DUSTY ET AL) 28 April 1992 (1992-04-28) column 1, line 51 - line 68 column 2, line 23 - line 35 figure 1</p> <p style="text-align: center;">----</p>	4,5
A	<p>USSELMANN R: "SBUS: AN OPEN BUS ARCHITECTURE" IEEE MICRO,US,IEEE INC. NEW YORK, DECEMBER 1991, vol. 11, no. 6, page 80-83 XP000257476 ISSN: 0272-1732 * the whole document *</p> <p style="text-align: center;">-----</p>	6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/07489

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5526403 A	11-06-1996	CA 2153240 A WO 9417639 A CN 1095873 A	04-08-1994 04-08-1994 30-11-1994
US 5790817 A	04-08-1998	EP 0928550 A WO 9814023 A	14-07-1999 02-04-1998
US 5109402 A	28-04-1992	NONE	